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Weekly Bulletin

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EDITOR

A Radio Talk on Mosquitoes.

By LOUVA G. LENERT, in charge Mosquito Control Work, California State Board of Health.

(Radiocast over Station KLX, Oakland, May 6, 1925.)

The talk this evening will be a brief discussion of our too friendly enemy, the mosquito, its relation to disease and a practical means of minimizing its dangers and discomforts as much as possible.

We have all planned vacations and journeys afield with much anticipation of pleasure to find it marred almost at the very beginning by an attack of hordes of these insects during our first night out, and oftentimes the remainder of the outing consists chiefly of a test of endurance rather than one of enjoyment.

While the mosquito is generally looked upon as a joy-killer and a nuisance, the females of two of the more than thirty species of mosquitoes in the State of California are also the direct cause of the transmission and spread of malaria.

This transmission is only accomplished through the bite of this particular mosquito, and in order to be infective the mosquito must first obtain a blood meal from a person who has malaria parasites in his system. Even then it is not capable of transmitting the disease until a certain development has taken place within the stomach of the mosquito. This requires about a week, after which the mosquito remains infective for life. Fortunately, the span of life of a mosquito is short, the great mass dying three or four weeks after hatching, though some individuals may hold on for several months.

Only a limited area in the west is suitable for the biological development of the malaria parasite in the mosquito and consequently malaria is not prevalent through the greater part of the State, even when malaria-carrying mosquitoes are present in large numbers.

People who live continuously in non-malarious districts are much more susceptible to the disease than are the permanent residents of a malarious community and it is thus more necessary for them to take precautions against mosquito bites.

Many communities of California which have a malaria problem have formed mosquito abatement districts, combatting the spread of malaria by the elimination of the mosquito which carries the disease. Such a community reaps a double reward, it controls the disease and at the same time eliminates the insect pest, the destruction of all mosquitoes being included in control measures, thus giving a return in comfort which can not be valued in dollars and cents.

The measures employed in eliminating mosquitoes are very simple, practically all of them being directed against the larval stage of the insect. In order to fully understand the methods used, it is necessary to be familiar with the general life history of mosquitoes. There are four stages of development, the egg, the larva or wiggler, the pupa or tumbler, and the adult mosquito. The eggs, about 200 of them at one laying, are deposited upon the surface of water, upon soft mud, or along the edges of containers where, by instinct, the female mosquito knows water will eventually reach them. The eggs remain in a dormant condition until they come in contact with water. After this they hatch very rapidly, in 24 to 48 hours, into the larval or wiggler stage.

This stage of the mosquito's life is entirely aquatic. It must have water to move about and seek its food, as it feeds entirely upon micro-organisms found in the water. Mosquito larvae are also true air-breathers, being equipped near the tail with an air tube which they project through the surface of the water for breathing. It is this particular stage of the mosquito's life that is most vulnerable and most control measures are directed against it at this time. It spends about five to eight days in this stage before it develops into the pupa or tumbler.

In this form it is still an aquatic insect and a true air-breather, though the air tubes are now located on the head; the pupa is provided with no mouth and hence does not feed. Twenty-four to forty-eight hours are spent as a pupa, after which the pupal case breaks open at the surface and the adult mosquito emerges to begin its pestiferous existence.

Thus from laying the egg to the emergence of the adult mosquito may be as short as eight days, under favorable conditions of temperature and food supply, all of which, with the possible exception of the last 24 hours, must be passed in water.

We have then, as our most positive means of control, the elimination of water in which they may breed—drainage. Drainage for mosquito control is not necessarily as extensive as for agricultural purposes and the plan followed will vary with local conditions, but in general it includes elimination of all water which stands on the surface longer than five days, or, providing a current, without eddies, in which mosquitoes will not breed.

It is not always possible to eliminate all water; the remedy then lies in making the water unfit for mosquito breeding. This may consist of introducing natural enemies or of poisoning the supply so as to destroy the larvae.

The only natural enemies which have been found especially useful are top-minnows, a species of fish which seeks its food at the surface and whose particular "piece de resistance" is insect food. Many people who enjoy having a pool or fountain on their premises have been forced to discard them because of the mosquito menace. This is not necessary as the introduction of fish of the proper species will absolutely prevent mosquito breeding.

The only fish recommended for this purpose without qualifications, also used in streams, sloughs, horse-troughs and almost all types of permanent water supply, is known as Gambusia Affinis. They are very hardy and are able to penetrate to very shallow depths in search of food. Gambusia are vivaporous, giving birth to live young. Broods will average approximately 40 young, and during the breeding season, from May to October, they probably occur every thirty days. Their life of usefulness begins immediately, as the young have been observed to attack mosquito larvae fully half their own length on the day of birth.

The only requirements to be fulfilled in mosquito control with fish is a permanent water supply, reasonably free of pollution, with a surface free of debris, floatage and excessive vegetation. Many thousands of these fish have been supplied free to communities throughout the State of California by the State Board of Health, the only condition being that the consignee bears the transportation charges. In many instances the fish can now be secured locally from hatcheries established in the various communities.

Unfortunately, many mosquito breeding places can not be permanently eliminated, nor can fish control be introduced for various reasons. In such cases it is necessary to poison the breeding places and kill the larvae. The most common method is by spreading upon the surface a very thin film of oil. In coming to the surface for air the mosquito larva takes a minute portion of oil into its system through the breathing tube and it dies within a very short time. The film must be complete, however, or the larvae will come to the surface at points not covered and will continue their existence undisturbed. Oiling must be done every week to be certain that each succeeding crop of mosquitoes is destroyed. Any of the lighter grades of oil are suitable, the most effective probably being coal oil, but for economic reasons, and technic in application, stove distillate or stove-tops are usually used. The best method of application is through a spray nozzle under pressure, though for small areas the oil may be poured on and then the water is thoroughly agitated in order to secure a good spread of the film.

In mosquito control where only malaria mosquitoes are present, paris green is used. The larva of this mosquito feeds at the surface entirely, taking in small floating particles as food. The method of destruction is as follows: Take one part paris green to 100 parts road dust and mix thoroughly. Then, approaching the breeding place from the windward side, throw the dust into the air, by hand, so as to form a dust cloud which will settle as uniformly as possible over the surface of the water. A very small amount of the dust is necessary and the method is harmless to fish, or animals which may drink the water, though it is deadly to Anopheles or malaria mosquito larvae. This method is ineffective against the larvae of other varieties of mosquitoes as they do not seek their food at the surface of the water; neither is it effective against the pupae of Anopheles mosquitoes as at this stage of a mosquito's existence it does not feed. The paris green mixture must be applied about every ten days or less as in the case of oiling.

It is often impossible for the camper to stop in communities where mosquitoes are under control. In such cases it is advisable that screened tents or bed nets be used. Repellants may be used, but generally they are efficient for but a short time after application, and while they permit the victim to fall asleep they do not protect him from bites later in the night. Oil of pennyroyal, oil of citronella, oil of cedar and common coal oil are often used, but in many cases the smell of the repellant is as distasteful to the individual as to the mosquito itself.

Many remedies are offered as lotions to be used after a mosquito bites, but few are better than common soap rubbed over the spot affected.

No lotion will remove the malaria parasite injected by the Anopheles or malaria mosquito, but five grains of quinine sulphate taken daily while in a mosquito-infested district and for a short time after leaving will prevent the development of malaria.

A talk of this nature is necessarily of very general application and those wishing more specific data and information on the subject as a whole or any portion of it should consult their local health authorities or communicate directly with their State Board of Health.

Will Examine Children for Physical Defects.

More than half of the cases of serious communicable diseases that occur among children, are found in those who are of preschool age. This is contrary to the idea that most people have, for it is generally thought that children seldom are attacked by the communicable diseases until they begin their attendance at the public schools. Pneumonia, measles and whooping cough are specially prevalent among very young children and these diseases almost always leave unfavorable after-effects. Children who have had these diseases during infancy, as well as all children who are apparently well, should receive thorough physical examinations before entering school. No child who is physically handicapped can compete with school children who are physically sound. It is not fair to permit a frail, pale, undernourished child to enter school where he will be obliged to compete with well children.

In order that all children may have a chance to be made physically sound before entering school next fall, the Bureau of Child Hygiene of the California State Board of Health, is sponsoring conferences in many counties throughout the state, where preschool children may be brought for free physical examinations. Children who have suffered from any of the communicable diseases should be given the benefits of such an examination, without fail, and children who are to all appearances perfectly well, should also be brought to these conferences in order that any hidden defects may be discovered. Decayed teeth faulty nutrition, diseased tonsils, adenoids, faulty posture and many other conditions that are easily brought to light by the competent medical examiner, may be entirely overlooked by the parent. A thorough examination of the entering school child will go far in establishing the foundation of a sound physical condition, which is of great importance to the modern child.

These conferences are being conducted at the present time in many of the counties, but in some districts they will not be carried on until later. Health officers and public health nurses can give full information concerning the dates and places where conferences will be held. Should information be lacking in any locality, address a communication to the Bureau of Child Hygiene, California State Board of Health, 336 State Building San Francisco.

MORBIDITY.*

Diphtheria.

115 cases of diphtheria have been reported, as follows: Los Angeles 22, San Francisco 23, Fresno 11, Los Angeles County 6, Pasadena

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*From reports received on May 4th and 5th for week ending May 2d.

6, Berkeley 9, Glendale 7, San Fernando 2, Hermosa Beach 1, Redondo Beach 2, Maywood 1, San Diego County 1, Sacramento 1, Alameda 1, Richmond 1, Burbank 1, Sonoma County 3, San Jose 1, Vallejo 1, Fresno County 1, Chico 1, Kings County 1, Riverside County 1, Beverly Hills 1, Auburn 1, Santa Clara County 1, Albany 1, Huntington Park 1, Oakland 6.

Measles.

85 cases of measles have been reported, as follows: Los Angeles 46, San Francisco 10, Los Angeles County 9, Long Beach 4, San Diego 1, South Gate 3, Huntington Park 3, Pomona 2, National City 1, Fulleerton 2, Burbank 1, Whittier 1, Santa Monica 1, Oakland 1.

Scarlet Fever.

109 cases of scarlet fever have been reported, as follows: Los Angeles 25, Long Beach 10, San Francisco 10, Los Angeles County 8, Oakland 5, San Diego 4, Berkeley 4, Calaveras County 1, Ontario 2, Kern County 3, Ventura County 1, Chula Vista 1, Alhambra 1, Huntington Park 2, Pomona 2, Fullerton 1, Los Gatos 1, San Diego County 2, Fresno 1, Redwood City 1, La Mesa 1, Signal Hill 2, San Jose 2, Redlands 1, Santa Barbara 2, Sonoma County 1, Merced County 1, Kings County 2, Lassen County 1, Santa Clara County 3, Santa Ana 4, Orange County 3, Orange 1.

Smallpox.

169 cases of smallpox have been reported, as follows: Los Angeles 42, San Diego 24, Long Beach 11, Los Angeles County 13, Corning 9, Lynwood 5, Orange County 6, Sierra County 7, Oakland 19, San Francisco 2, Berkeley 1, National City 1, Yuba County 1, San Diego County 3, Kern County 3, El Dorado County 1, Butte County 2, Glendora 1, San Bernardino County 1, Alameda 1, Oroville 1, Sacramento 1, San Jose 3, Redlands 1, Sutter County 4, Lassen County 4, Livermore 1, Santa Ana 1.

Whooping Cough.

420 cases of whooping cough have been reported, as follows: San Francisco 70, Los Angeles 59, Berkeley 41, Los Angeles County 21, Stockton 27, San Diego 23, Sacramento 11, Long Beach 10, Pasadena 10, San Joaquin County 5, Alhambra 7, Riverside 5, Glendale 6, Fresno 5, Paso Robles 7, San Luis Obispo County 10, Palo Alto 7, Santa Paula 8, Merced County 6, Oakland 26, Corona 4, Manteca 1, Calaveras County 3, South Gate 2, Hawthorne 2, Ventura County 4, Gilroy 2, El Monte 4, Compton 1, Whittier 2, Pomona 1, Riverside County 1, Fullerton 1, National City 4, Alameda 2, Burbank 1, Modoc County 1, Lindsay 4, Fresno County 2, Lassen County 1, Santa Clara County 2, San Jose 2, Sonora 1, Orland 1, Daly City 1, Watsonville 1, Santa Ana 1, Santa Monica 3, Kingsburg 1.

Typhoid Fever.

11 cases of typhoid fever have been reported, as follows: Solano County 2, San Diego 1, San Francisco 1, Fresno 1, Alameda 1, Riverside County 1, Huntington Park 1, Los Angeles 2, Pasadena 1.

Leprosy.

Kings County reported one case of leprosy.

Poliomyelitis.

12 cases of poliomyelitis have been reported, as follows: Los Angeles 1, San Diego 3, San Francisco 2, Redondo Beach 1, Kings County 1, Santa Paula 1, Modesto 3.

Epidemic Encephalitis.

3 cases of epidemic encephalitis have been reported, as follows: Los Angeles 1, Kern County 1, San Francisco 1.

Rocky Mountain Spotted Fever.

Lassen County reported one case of Rocky Mountain Spotted Fever.

COMMUNICABLE DISEASE REPORT.

Disease	1925				1924			
	Week ending			Reports for week ending May 2 received by May 5	Week ending			Reports for week ending May 1 received by May 4
	April 11	April 18	April 25		April 12	April 19	April 26	
Anthrax	0	0	0	0	0	0	0	0
Chickenpox	254	301	325	220	451	409	406	349
Diphtheria	112	90	109	115	236	233	205	187
Dysentery (Bacillary)	3	1	3	0	0	2	0	0
Epidemic Encephalitis	2	3	3	3	0	6	5	2
Epidemic Meningitis	2	3	2	0	2	0	0	4
Gonorrhoea	95	109	113	60	105	66	70	167
Influenza	45	61	35	61	33	18	17	21
Leprosy	1	1	0	1	1	0	0	0
Malaria	0	1	0	1	3	3	1	1
Measles	106	105	120	85	1671	1282	1281	1006
Mumps	229	330	472	385	69	65	70	45
Pneumonia	114	76	42	38	89	64	58	86
Poliomyelitis	3	1	12	12	1	1	0	0
Rocky Mt. Spotted Fever	0	0	0	1	0	2	0	1
Scarlet Fever	119	115	129	109	268	224	196	199
Smallpox	121	161	189	169	412	377	317	342
Syphilis	172	131	102	178	125	105	88	177
Tuberculosis	261	282	169	202	278	215	273	171
Typhoid Fever	8	15	12	11	19	22	19	16
Whooping Cough	358	486	450	420	57	42	47	30
Totals	2005	2272	2287	2071	3820	3134	3053	2803

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